Panel Discussion I
What are the Grand Challenges for Symbolic, Numeric and Algebraic Scientific Computing?
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Moderator
Panel Members

- James Demmel (UC Berkeley)
- Randolph Franklin (Rensselaer)
- Jeremy Johnson (Drexel)
- Marianna Safronova (Delaware)
- Jan Verschelde (UI Chicago)
Question #1: Why does numeric computing need symbolic computing? Why does symbolic computing need numeric computing?
Question #2: How does one record mathematical knowledge?
Question #3: Are the most efficient mathematical algorithms made by humans, or synthesized by computers?
Question #4:
Cell phones have digital filters derived from symbolic Gröbner basis;
the Shell corporation searches for oil using the Buchberger-Möller algorithm;
mechanical Stewart-Gouch platforms are described by algebraic varieties;
the Phillips corporation can reduce their models via symbolic-numeric sparse interpolation:
is the next killer application of symbolic and numeric computation really predictable?
Question #5 (not discussed) Can OpenSource and academically developed libraries such as LAPack and LinBox and systems such as SAGE compete with commercial mathematical software?